

BLACK & VEATCH

South Florida Water Management District

EAA Reservoir A-1 Basis of Design Report

January 2006

APPENDIX 2-1

**ENVIRONMENTAL EXISTING CONDITIONS
TECHNICAL MEMORANDUM**

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TECHNICAL MEMORANDUM

South Florida Water Management District
EAA Reservoir A-1
Work Order No. 5

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Task 5.2.5.2 Data Gathering Review and Existing Conditions Technical Memorandum

1. VEGETATION AND WETLANDS

1.1 *Existing Conditions*

The project area covered under this report encompasses Parcel A of the planned Everglades Agricultural Area Storage Reservoir (EAA) project in western Palm Beach County (USACE, 2000). The U.S. Fish and Wildlife Service's (USFWS) land analysis presented in the November 3, 2003 Existing Condition Report combines parcels A, B, and C of the EAA. The land use within the project area consists of 18 significant land cover classes consisting primarily of sugarcane crops (74%), and bare soil/clear-cut, (22%). The additional 16 land cover types comprised the remaining 4% (USFWS, 2003). Parcel A consists of a total of 31,495 acres composed of approximately 583 acres of open water, 97 acres of shrub and brushland, 206 acres of wetland, and the remaining 30,609 acres is agricultural.

The project area is underlain by Pahokee Muck, Depressional; and Lauderhill Muck, Depressional. These two soils are optimal for supporting sugar cane agriculture. The soils are generally organic sediments categorized by the United States Department of Agriculture, Natural Resource Conservation Service as Everglades peat. Lauderhill and Pahokee Muck, are typically black and very dark brown mucky soils underlain by soft, porous limestone bedrock. Lauderhill soils occur to a depth of about 30 inches and Pahokee soils occur to a depth of about 46 inches. These soil types are typically ponded for 9 to 12 months in most years in broad open areas within sawgrass marshes (USDA, 1978). Figure 1 shows the general soil map units within the project area. More detailed information regarding soils can be found in Table 2 and Figure 2 of the Environmental Existing Conditions Report prepared by the USFWS (2003).

Land use within the project area was reported in the Environmental Existing Conditions Report using the Florida Fish and Wildlife Conservation Commission (FWC) Land Cover categories. It was determined that the available Florida Land Use, Cover and Forms Classification System (FLUCCS) data was insufficient to accurately identify habitat types. Figure 2 shows the FLUCCS mapping available for the project area. The FLUCCS database identifies the majority of the project area as non-forested wetland and mixed urban/built-up land. According to the FWC Land Cover data agricultural lands planted with sugarcane dominate the project area. Open water communities exist in the form of canals, shrub and brushland communities in the northeastern portion of the project area, and small isolated wetlands are scattered throughout the property. A detailed description of each community type is provided below (USFWS, 2003). More information can be found on the land cover classes within Parcel A in Table 4 and Figure 3 of the Environmental Existing Conditions Report prepared by the USFWS (2003).

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1.2 Common Land Cover Classes On-Site

1.2.1 Aquatic (Open Water)

The aquatic land cover class includes canals and any depressional areas with an elevation low enough to allow standing water, but does not have any characteristics representative of wetlands. Based on FWC land cover data presented in the Environmental Existing Conditions report, open water in the form of interior agricultural canals comprise approximately 583 acres of land cover within Parcel A (2003).

The aquatic land cover class may support spatterdock (*Nuphar* spp.), water hyacinth (*Eichornia crassipes*), water lettuce (*Pistia stratiotes*), water lilies (*Nymphaea* spp.), American lotus (*Nelumbo lutea*), and musk grass (*Chara* spp.) (FWS, 2003).

1.2.2 Agricultural Land

Sugarcane is the primary crop in the area consisting of approximately 9,711 acres of land cover within parcels A, B, and C. Exact acreage calculations of agricultural land are not available for the project area (Parcel A); however, estimates based on interpretation of aerial photography suggest that as much as 99% or 30,609 acres of the project area consist of active agricultural land planted in sugarcane (FWS, 2003). See Figure 3.

1.2.3 Shrub and Brushland

The shrub and brushland cover class includes a variety of situations where natural upland community types have been recently disturbed through the clear-cutting of commercial pinelands, land clearing, or fire, and are recovering through natural successional processes. Based on land cover data presented in the Environmental Existing Conditions report, shrub and brushland comprise approximately 97 acres of land cover within Parcel A (USFWS, 2003).

This land cover class could be characterized as an early condition of old-field succession. Various shrubs, tree saplings, and grasses and herbs dominate this community. The shrub and brushland land cover class may include vegetative species such as blackberry (*Rubus* spp.), bushy broomsedge (*Andropogon glomeratus*), dog fennel (*Eupatorium* spp.), elderberry (*Sambucus canadensis*), fetterbush (*Leucothoe racemosa*), gallberry (*Ilex glabra*), oaks (*Quercus* spp.), pines (*Pinus* spp.), saltbush (*Baccharis halimifolia*), saw palmetto (*Serenoa repens*), staggerbush (*Lyonia nutt*), winged-sumac (*Rhus copallina*), and wax myrtle (*Myrica cerifera*) (USFWS, 2003).

1.2.4 Wetland

A desktop survey of the project area identifying 81 potential wetland areas was conducted by the USFWS. A portion of the National Wetlands Inventory (NWI) map showing the location of wetlands and uplands within the project area is provided in Figure 4. The location and acreage of potential wetlands as determined by the USFWS is shown on Figure 5 and listed in Table 1. To verify the existence of the desktop wetlands, aerial surveys were conducted by an interagency team of EAA project biologists representing the USFWS, U.S. Army Corps of Engineers (USACE), South Florida Water Management District (SFWMD), U.S. Environmental Protection Agency (USEPA), FWC, and Florida Department of Environmental Protection (FDEP). Of the 81 potential wetlands surveyed, 77 are actively farmed or lack vegetation. The five verified

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wetlands total approximately 205.88 acres (Figure 6). More detailed information regarding these wetlands can be obtained from the Environmental Existing Conditions Report, Table 8 (2003).

The five (5) verified wetlands were grouped into categories based on percent of woody, herbaceous, native, and exotic/nuisance vegetation present in the wetlands (Table 2). A detailed description of each category is provided below.

Category 1 consists of 80% native herbaceous vegetation such as maidencane (*Panicum hemitomon*), arrowhead (*Sagittaria* spp.), and pickerelweed (*Pontederia cordata*). Category 2 consists of approximately 51% to 80% native herbaceous species. Category 3 consists of over 80% exotic and or/ nuisance vegetation such as primrose willow (*Ludwigia peruviana*) and Brazilian pepper (*Schinus terebinthifolius*). Category 4 wetlands consists of 51%-80% exotic and /or nuisance shrub species such as Chinese privet (*Ligustrum sinense*) and Ceaser weed (*Urena lobata*). Category 5 consists of 80% exotic and or/ nuisance herbaceous vegetation such as torpedo grass (*Panicum repens*), paragrass (*Urochloa mutica*), and limpo grass (*Hemarthria altissima*). Category 6 consists of approximately 51% to 80% exotic and or/ nuisance herbaceous species (USFWS, 2003). Wetland acreages per category found within the project area are listed in Table 3.

Categories 1 and 5 exhibit characteristics corresponding to Freshwater Marsh wetlands. Category 3 includes wetland habitat consistent with Shrub Swamp. Category 6 exhibits characteristics of both Freshwater Marsh and Shrub Swamp (USFWS, 2003).

1.2.4.1 Shrub Swamp

Shrub swamps are associated with topographical depressions and poorly drained soil (USGS, undated). This wetland community is an area that may have experienced environmental change such as, increased/decreased hydroperiods, fire, clear cutting, and clearing. The vegetative composition may be dominated by one species of vegetation or may have an array of opportunistic species. Typical vegetation may include wax myrtle and Carolina willow (*Salix carolina*). A variety of exotic vegetation such as primrose willow and Brazilian pepper may be present, but shrubby species such as button bush (*Cephalanthus occidentalis*) and swamp rose (*Rosa palustris*) typically dominate (EPA, (USEPA, 2002).

1.2.4.2 Freshwater Marsh

Freshwater marshes are predominately grassy wetlands found in areas with minimal gradients of topography, hydrology, and soil. Freshwater marsh hydrology is derived predominantly by surface waters; groundwater is not a source of input (EPA, 2002). The vegetation in Freshwater marshes is dominated by grasses, rushes, and sedges (USGS, 2005). Commonly found species include bulrush (*Scirpus* spp.), cattail (*Typha* spp.), whitetop sedge (*Dichromena colorata*), sawgrass (*Cladium jamaicense*), spike rush (*Eleocharis* spp.), and soft rush (*Juncus effusus*) (USFWS, 2003).

To determine the habit quality of the five (5) verified wetlands, the interagency team of EAA project biologists performed an on-site wetland habitat assessment using the Wetland Rapid Assessment Procedure (WRAP). Two of the five (5) wetlands were inaccessible and were assigned an average category WRAP score based on data obtained at wetlands with similar characteristics. Table 4 lists the WRAP scores for each of the five (5) wetlands.

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1.3 Potential Impacts

Due to the limited acreage of natural habitats and the presence of extensive sugarcane farms, adverse effects to native vegetative communities are limited to wetland areas. As a result of the proposed project, approximately 205.88 acres of emergent and scrub-shrub wetland will be converted to open water aquatic habitat. Mitigation for wetland impacts will be provided pursuant to legislation developed specific to CERP projects. Mitigation options, if necessary, will be explored further during the final design phase of the project. All impacts to upland areas consist of agricultural lands.

2. FISH AND WILDLIFE

Historically, the project area (Parcel A) was predominately sawgrass marsh; however, wet prairie and slough communities were present (Audubon, 2003). In the mid-1900's the area was drained for agricultural production of sugarcane and rice (GFC, 1998). Prior to the agricultural alterations to this area, wildlife was similar to that found on the adjacent Holey Land Wildlife Management Area (WMA). Wildlife species typically seen at the Holey Land WMA include white-tailed deer, common snipe, marsh rabbit, blue-winged teal, mottled ducks, and other waterfowl (FWC, 2005).

2.1 Existing Conditions

Currently, the proposed project area is dominated by sugarcane with small isolated emergent wetlands interspersed and drainage canals dissection the property. (Figure 7). The USFWS stated that native habitats for fish and wildlife are not a significant component of the project area due to alterations for agriculture that have removed most native vegetation (USFWS, 2003). As described in the Environmental Existing Conditions report, the quality of habitat provided by the existing wetland and canal communities is low. However, these wetland habitats do provide foraging habitat for birds (Lodge, 1996), and the canals provide habitat for fish, reptiles, and invertebrates. A review of the FWC Integrated Wildlife Habitat Ranking System determined that habitat values within the project area are ranked between 2 and 4 (USFWS, 2003). Turkey vultures (*Cathartes aura*) were observed by Birkitt Environmental Services (BES) during site inspections of the test cell sites.

The National Oceanographic and Atmospheric Administration's (NOAA), National Marine Fisheries Service (NMFS) was contacted on March 18, 2003 by the SFWMD concerning Essential Fish Habitat (EFH) designations for canals. NMFS responded that no EFH designation exists for canals within the project area. In addition, NMFS stated that the South Atlantic Fisheries Management council does not manage the anadromous fish species that may occupy these areas (USFWS, 2003).

2.2 Potential Impacts

Due to the limited natural habitats within the project area, long-term adverse impacts to fish and wildlife are not anticipated. Waterfowl, fish, and reptiles may experience temporary impacts due to the elimination of agricultural ditches and isolated wetlands. Impacts to all wildlife species can be minimized by gradually flooding the area, thereby allowing terrestrial wildlife to vacate the area (USFWS, 2002). However, following construction, new habitat will be created for these species that will afford similar foraging opportunities. In addition, conversion of these agricultural areas to functional habitat will benefit the efforts to restore the surrounding

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Everglades. The Governors Commission for a Sustainable South Florida states that acquiring lands in the EAA for water storage, retention facilities, additional sites for water quality treatment, and restoration of short hydroperiod wetlands will provide important upstream flow moderation and ecological benefits to the Everglades and to South Florida (Audubon, 2003). According to the Audubon of Florida, “alternative uses of lands degraded by agricultural activities could provide significant water storage and water quality benefits” and that “this type of habitat restoration, while not resulting in ‘pristine’ Everglades, is nonetheless valuable (2003).”

3. PROTECTED SPECIES

3.1 Existing Conditions

Information on protected species within the project area was compiled by the USFWS in preparation for the Environmental Existing Conditions Report and BES in preparation for site evaluations of the test cell sites using the following sources:

- USFWS Federal list of Endangered Species, and Threatened Species
- Florida Natural Areas Inventory (FNAI) Standard Report
- FWC Integrated Wildlife Habitat Ranking System
- SFWMD Direct Correspondence with NOAA
- FWC Wildlife Occurrence Database
- FWC Breeding Bird Atlas
- FWC Wading Bird Rookeries
- FWC Panther Telemetry and Road Kills Data
- FWC Eagles Nest Locator Database
- FWC Wildlife Potential Habitat Models

Appendix 4-1 lists state and federal protected species for Palm Beach County, Florida. The FNAI was consulted regarding the presence of elemental occurrences within the project area. A search of the FNAI database revealed no elemental occurrences in the project area; however, potential habitat for the wood stork (*Mycteria americana*) and Florida panther (*Puma concolor coryi*) was identified southwest of the project area in the Holey Land WMA (FNAI, 2005). A copy of the FNAI report is included in Appendix A of this report.

The Florida burrowing owl (*Athene cunicularia floridana*) is listed as a Species of Special Concern by the state of Florida and is protected under the Migratory Bird Treaty Act. During field surveys conducted by the interagency EAA team, two (2) burrowing owls were observed in a planted field within the project area. Burrowing owl nesting sites have been confirmed on adjacent parcels of land, but no information regarding nesting sites within the project area is available (USFWS, 2003).

The Panther Radio Telemetry Database was consulted to determine the likelihood of impacting the federal and state listed endangered Florida Panther. Between 1981 and 2001 no panthers were detected within the project area. However, three (3) panthers were detected within the EAA, including one in the Holey Land WMA. The Panther Road Kill database was also reviewed and no panther roadkills were documented in the EAA or the project area. The closest roadkill was documented two (2) miles west of the EAA boundary. More information regarding

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the Florida Panther can be found in Figures 12 and 13 of the Environmental Existing Conditions Report prepared by the USFWS (2003).

The bald eagle (*Haliaeetus leucocephalus*) is a federal and state listed threatened species. According to the FWC's Eagle Nest Locator database there are no known nests within the proposed project area (FWS, 2003; FWC, 2005). Five nests have been reported in Palm Beach County prior to 2002. Three of these five nests were reported along the shores of Lake Okeechobee. The remaining two were reported along canals (USFWS, 2003). No nests are reported within 14 miles of the proposed project area. Figure 8 shows the location of the closest bald eagle's nest in relation to the project site. More information regarding the location of the bald eagle nests can be found in Figure 14 of the Environmental Existing Conditions Report prepared by the USFWS (2003).

No wading bird rookeries were identified by the USFWS' database search of the FWC wading bird Rookeries. The location of rookeries adjacent to the project area can be found in Table 17 and Figure 8 of the Environmental Existing Conditions Report prepared by the USFWS (2003).

The FWC Potential Habitat Model was used by the USFWS to identify and calculate potential habitat areas for those wildlife species that may occur in the project area. This data is reported in the Environmental Existing Conditions report and includes both protected and non-protected wildlife species. These models combined multiple land parcels (Parcels A, B, and C) into one group for assessment purposes. The proposed project site is located in Parcel A. Out of 33 possible species within the 3 parcels, potential habitat was identified for 14. Of these, one is federally endangered (wood stork) and two are federally threatened (American alligator and eastern indigo snake).

3.2 Potential Impacts

Due to the limited natural habitats on-site, no long-term adverse impacts to state or federal protected species are anticipated. However, no information on burrowing owl nests is available for the project area. Potential habitat in the adjacent Holey Land WMA will be impacted indirectly by the control of water levels and improved water quality at the WMA. In addition, the Holey Land WMA will be temporarily impacted by noise from construction activities. Noise impacts would vary according to the construction activity occurring on any particular day and would cease when construction is completed.

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TABLES

Table 1 Potential Wetlands Identified within the Proposed Project Area (Parcel A)

Wetland ID	Square Feet	Acreage
A - 1	22,906	0.5259
A - 2	23,194	0.5325
A - 3	23,523	0.54
A - 4	24,762	0.5685
A - 5	25,603	0.5878
A - 6	26,540	0.6093
A - 7	27,018	0.6202
A - 8	27,027	0.6205
A - 9	27,325	0.6273
A - 10	28,257	0.6487
A - 11	28,908	0.0036
A - 12	29,389	0.6747
A - 13	31,054	0.7129
A - 14	31,543	0.7241
A - 15	32,004	0.7347
A - 16	32,913	0.7556
A - 17	33,615	0.7717
A - 18	33,711	0.7739
A - 19	33,754	0.7749
A - 20	34,640	0.7952
A - 21	34,648	0.7954
A - 22	35,068	0.8051
A - 23	35,399	0.8127
A - 24	35,722	0.8201
A - 25	36,219	0.8315
A - 26	36,332	0.8341
A - 27	37,453	0.8598
A - 28	38,125	0.8752
A - 29	38,667	0.887
A - 30	40,605	0.9322
A - 31	43,421	0.9968
A - 32	43,463	0.9978
A - 33	43,960	1.0092
A - 34	43,986	1.0098
A - 35	44,239	1.0156
A - 36	44,257	1.016
A - 37	45,019	1.0335
A - 38	45,176	1.0371
A - 39	45,717	1.0495

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Wetland ID	Square Feet	Acreage
A - 40	45,785	1.0511
A - 41	47,496	1.0903
A - 42	47,778	1.0968
A - 43	48,867	1.1218
A - 44	49,607	1.1388
A - 45	50,457	1.1583
A - 46	51,862	1.1906
A - 47	55,991	1.2854
A - 48	58,561	1.3444
A - 49	61,557	1.4132
A - 50	66,780	1.5331
A - 51	71,522	1.6419
A - 52	74,223	1.7039
A - 53	76,188	1.749
A - 54	77,883	1.7879
A - 55	79,069	1.8152
A - 56	80,249	1.8423
A - 57	82,881	1.9027
A - 58	86,707	1.9905
A - 59	89,876	2.0633
A - 60	99,243	2.2783
A - 61	100,602	2.3095
A - 62	105,181	2.4146
A - 63	119,737	2.7488
A - 64	123,434	2.8337
A - 65	123,697	2.8397
A - 66	124,730	2.8634
A - 67	124,854	2.8663
A - 68	130,751	3.0016
A - 69	132,046	3.0314
A - 70	133,775	3.0711
A - 71	142,209	3.2647
A - 72	150,741	3.4605
A - 73	177,763	4.0809
A - 74	203,050	4.6614
A - 75	225,774	5.1831
A - 76	369,311	8.4782
A - 77	395,498	9.0794
A - 78	569,277	13.0688
A - 79	907,068	20.8234
A - 80	5,308,821	121.8738
A - 81	6,951,047	159.5741
Source: (USFWS, 2003)		

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Table 2 Wetland Vegetation Categories

Category	Vegetation
1	Native Herbaceous Dominated (< 20 % Shrub)
2	Native Mixed Herbaceous (20% -49% Shrub)
3	Exotic/Nuisance Shrub Dominated (< 20 % Herbaceous)
4	Exotic/Nuisance Mixed shrub (20 to 49% Herbaceous)
5	Exotic/Nuisance Herbaceous Dominated (< 20 % Shrub)
6	Exotic/Nuisance Mixed Herbaceous (20% to 49% Shrub)
Source: (USFWS, 2003)	

Table 3 Wetland Acreages Per Category Within the Proposed Project Area (Parcel A)

Cat 1 Wetlands/ Acres	1 / 13.07
Cat 2 Wetlands/ Acres	0 / 0
Cat 3 Wetlands/ Acres	1 / 1.73
Cat 4 Wetlands/ Acres	0 / 0
Cat 5 Wetlands/ Acres	1 / 3.45
Cat 6 Wetlands/ Acres	2 / 187.63
Total Wetlands/ Acres	5 / 205.88
Source: (USFWS, 2003)	

Table 4 WRAP Scores for Wetlands Within the Project Area (Parcel A)

Wetland ID	Vegetation Category	WRAP Score
A-78	1	0.50
A-75b	3	0.36
A-75a	5	0.40
A-80	6	0.38
A-81	6	0.38
Source: (USFWS, 2003)		

FIGURESFigure 1 EAA Soils Classification Map

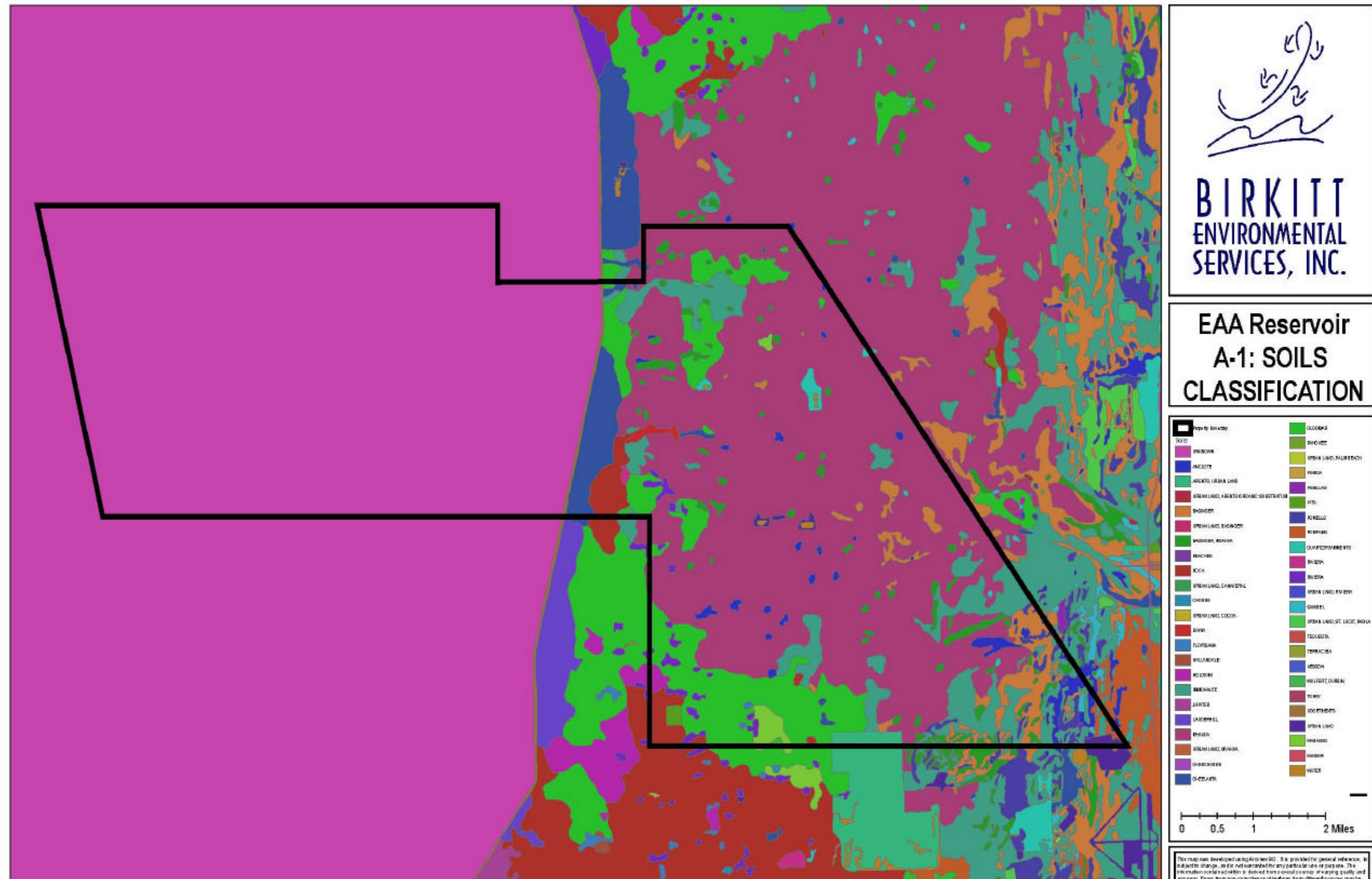


Figure 2 Florida Land Use, Cover and Forms Classification System (FLUCCS)

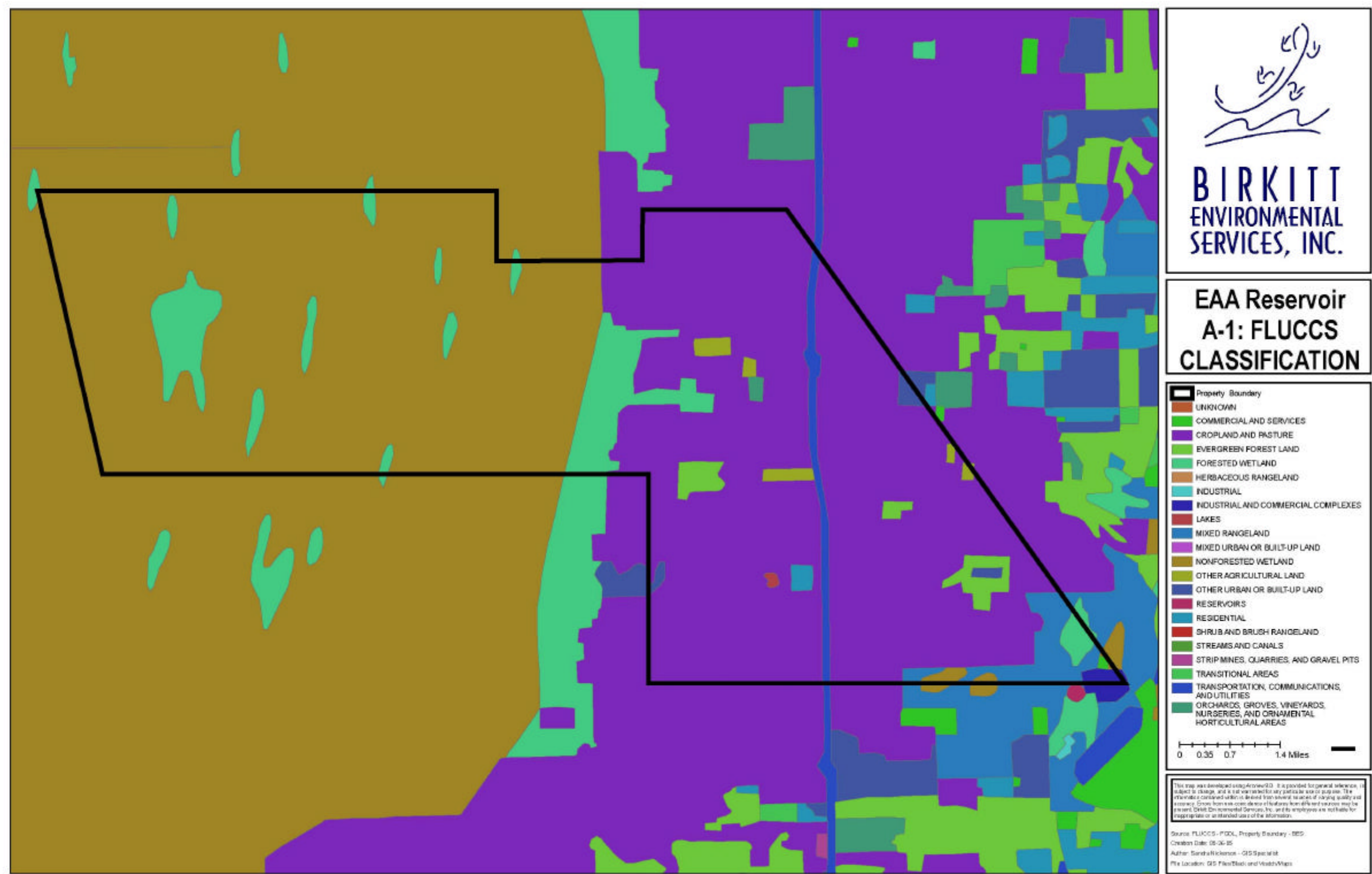


Figure 3 Recently Harvested Sugarcane Field at Proposed Project Site



Figure 4 National Wetlands Inventory Mapping

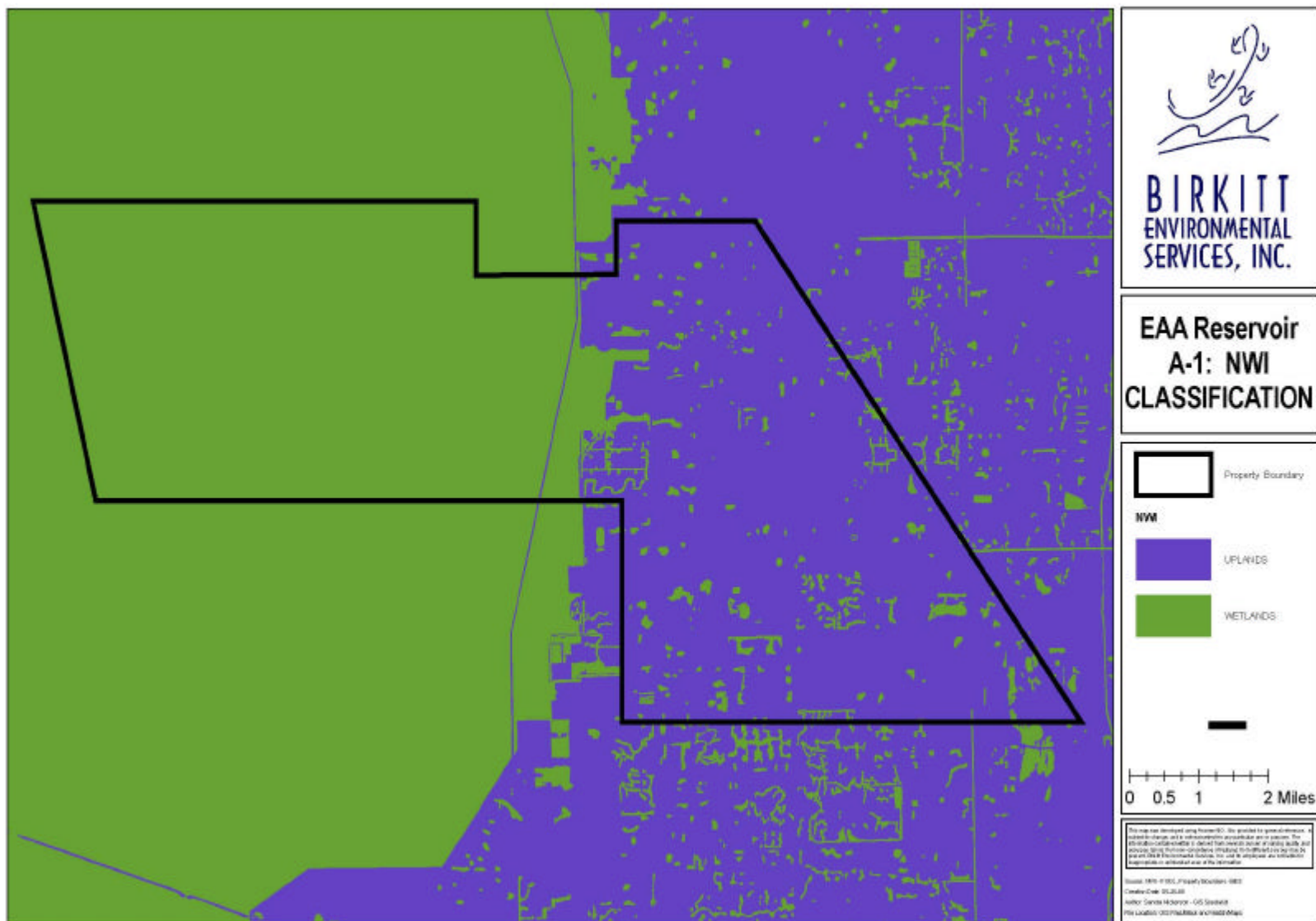


Figure 5 Potential Wetlands

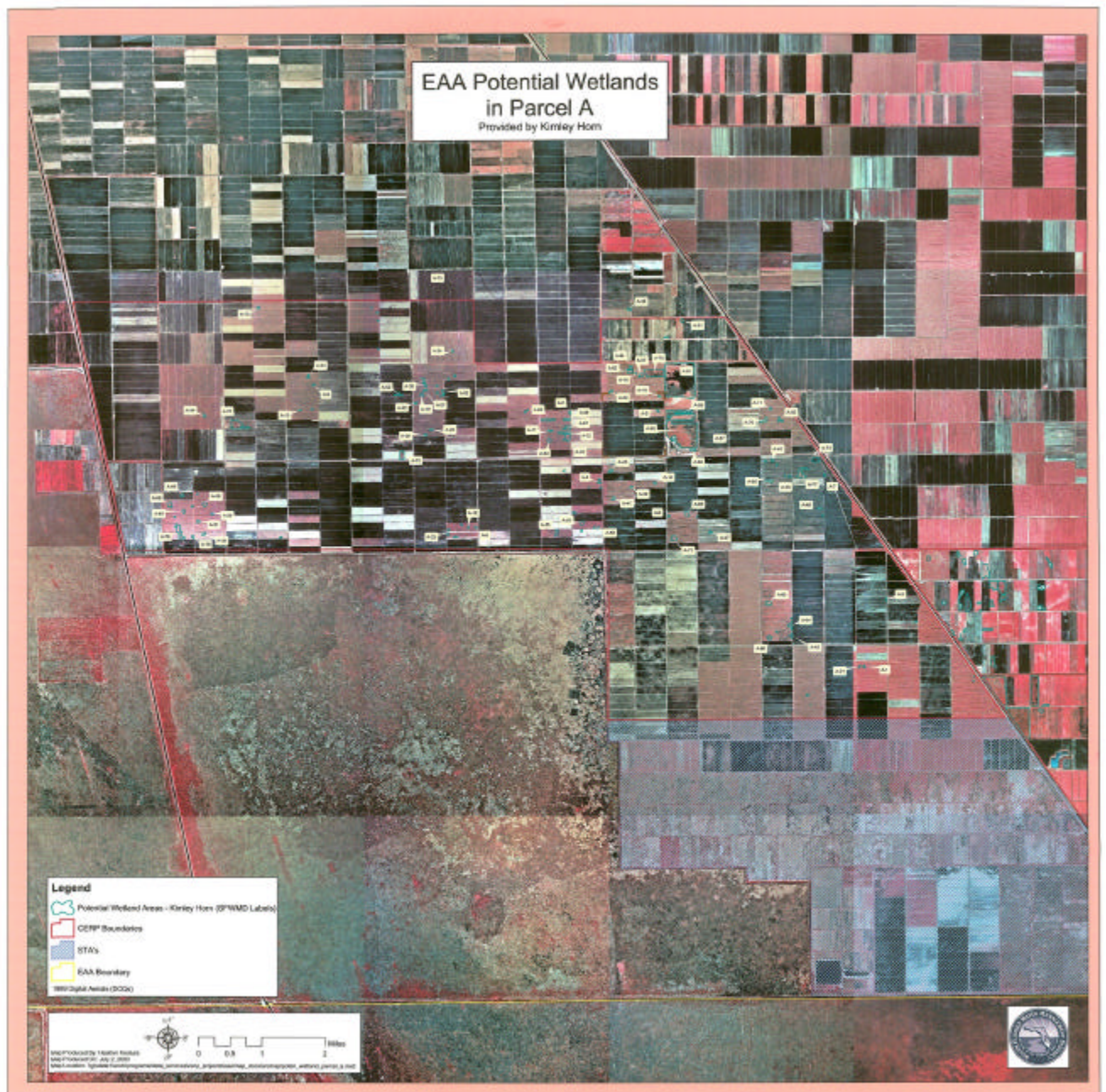


Figure 6 Existing Wetlands within the Project Area



Figure 7 Example of Existing Conditions at the Proposed Project Area



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Figure 8 Bald Eagle Locator Map

